

**Comments on revised ATLAS C&I Cost
Estimates 2002 - 2005**

Introduction Following the request of the RRB Scrutiny Group (SG) in June 2001, ATLAS submitted to SG its M&O and C&I (A, B, C) cost estimates 2002 – 2007 in August further scrutiny. The results of the partial scrutiny of C&I (A) were presented in the October 2001.

This document provides comments and clarifications to the updated C&I cost estimates 2002 – 2005 (with a time frame up to 2010) submitted to the joint LHCC-RRB SG in February, 2002.

Methodology The methodology used to collect the C&I cost estimates is summarized in Table 1:

Table 1. Methodology

#	Step
1	Update the cost estimates from October 2001 by systems using the original template
2	For C&I (A), use the original template (M&O (A))
3	For C&I (B), use the new template and guidelines provided by SG, using a “transformation matrix” to ensure a homogenous approach to cost item recording across the different systems (Appendix 1)
4	Collect plans on Institute technical manpower to be sent to CERN for installation and integration activities; identify what share is expected to be offered by Funding Agencies as in-kind contributions

**Comments on revised ATLAS C&I Cost Estimates
2002 - 2005** (Cont'd)

Assumptions The assumptions made while providing the updated cost estimates are summarized in Table 2:

Table 2. Assumptions

#	Assumption
1	The initial ATLAS detector is ready for physics data taking by April 2006
2	Institute technical manpower includes technicians (and possibly engineers) sent to CERN for maintaining the respective systems, not accounted for by Funding Agencies as contributions to C&I
3	Hired manpower includes industrial personnel hired locally at CERN or institute personnel offered by Funding Agencies as in-kind contributions to C&I
4	The recognized value of a technician is 80 kCHF/year and for a qualified engineer (e.g. systems manager) 120 kCHF/year
5	Institute manpower originally planned for installation and integration work at CERN (and contained within the recognized integrated manpower effort of 5 315 man-years) is not part of hired institute manpower

C&I (A) The following comments and clarifications are made to the collected C&I (A) cost estimates (Table 3):

Table 3. Comments, clarifications to C&I (A)

#	Comment
1	Magnet integration in B180 and in Pit 1: Estimates given by D Schinzel/F Haug
2	Detector integration work: design work for final configuration control and services integration
3	General technical support: Operation of the traction system, cooling plant and TDAQ
4	Heavy transport: Moving of magnet and detector elements to the pit
5	Crane drivers: 2-5 crane drives needed to operate 7 cranes in Pit 1

Comments on revised ATLAS C&I Cost Estimates 2002 - 2005

(Cont'd)

C&I (B)

The revised C&I (B) cost estimates are provided using the new template. Appendix 1 shows the guidelines used to translate the previous cost estimates from the original template.

Despite trying to ensure a homogenous approach across the different ATLAS systems, a number of apparent inconsistencies remained in the draft figures submitted to SG in early February. Revised cost estimates, as well as additional clarifications, are attached to this document.

These comments or corrections are summarized in Table 4:

Table 4. Comments, clarifications to C&I (B)

#	Comment
1	ID: a. Assumptions related to the cost and use of NMR probes have been clarified b. Technical manpower from institutes originally included physicists. They have been removed from the revised figures c. Communications costs added 5kCHF/y to be consistent with other systems
2	LAr: a. Hired manpower has increased in 2002 and 2003 due to agreed transfer of resources from the CORE construction budget to C&I (ca. 300 kCHF in 2002) b. Heavy transport (200 kCHF in 2004) moved to C&I (A)
3	TileCal: a. Revision of C&I estimates in line w.r.t supplementary costs, in order to avoid double-counting b. See separate note on cost drivers
4	Muons: a. Revision of C&I estimates to clearly separate M&O activities (unclear allocations of TB electronics, gas & cooling expenses) b. Communications costs added 5kCHF/y to be consistent with other systems

**Comments on revised ATLAS C&I Cost Estimates
2002 - 2005** (Cont'd)

Conclusions

The following conclusions are made (Table 5):

Table 5. Conclusions

#	Conclusion
1	Comments and corrections are made to the C&I tables submitted to LHCC-RRB SG for further scrutiny

EXPERIMENT: ATLAS						New C&I(B) format									
Previous C&I(B) format	Mech	Gas-s	Cryo-s	Cool	FE-el	Std-e-PS	Std-e-Cr	Std-e-R	Ctrl	Sub-d	Areas	Comm	Store	Hire-mp	
Detector related costs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Power supply															
Gas systems															
Gas consumption															
Cooling systems															
Cooling fluids(above –50°C)															
Cryogenic fluids (below –50°C)		x	x	x	x	x	x	x	x	x	x	x	x		
Moving/hydraulic systems															
Detector (re-)integration & survey															
General Technical support															
UPS maintenance															
Electronics pool rentals															
Counting & control rooms		x	x	x	x	x	x	x	x	x	x	x	x	x	
Communications															
GSM phones															
On-line computing															
System management															
Detector controls															
Computers/processors/LANs	x	x	x	x	x	x	x	x	x	x	x	x	x		
Software licenses															
Laboratory operations															
Assembly areas, clean rooms, active storage areas															
Workshops															
Laboratory instruments															
Electronics pool rentals	x	x	x	x	x	x	x	x	x	x	x	x	x		
General services															
Cranes															
Heavy transport															
Survey															
Consultancy															
Engineering	x	x	x	x	x	x	x	x	x	x	x	x	x		

M&O Cost Estimates in kCHF

M=Maintenance/Repairs

O=Operations

C=Consumables

EP-ATO/mn/080302

ATLAS C&I (A) ESTIMATES (kCHF)

2002 2003 2004 2005 2006 2007 TOTAL Notes

Detector related costs Type 665 1,870 2,885 1,965 0 0 7,385

Magnet	A	O	60	60	60	0	0	0	180
	A	C	25	25	25	0	0	0	75
Magnet controls	A	O	150	150	150	0	0	0	450
	A	C	30	45	50	0	0	0	125
Magnet power supply	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Gas systems	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Gas consumption	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Cooling systems	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Cooling fluids(above -50°C)	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
External cryogenics	A	O	0	640	1,060	400	0	0	2,100
	A	C	0	350	495	110	0	0	955
Cryogenic fluids (below -50°C)	A	O							0
	A	C							0
Moving/hydraulic systems	A	O							0
	A	C							0
Detector safety systems	A	O							0
	A	C							0
Shutdown activities	A	O							0
	A	C							0
Detector (re-)integration & survey	A	O	200	300	500	500	0	0	1,500
	A	C	0	0	0	0	0	0	0
General Technical support	A	O	160	240	320	320	0	0	1,040
	A	C	40	60	225	635	0	0	960
UPS maintenance	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Electronics pool rentals	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Beam pipe & vacuum	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Counting & control rooms	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0

Secretariat Type 0 0 0 0 0 0 0 0

Secretarial assistance	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Economat	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Fax, photocopiers, printers	A	O	0	0	0	0	0	0	0

	A	C	0	0	0	0	0	0	0
Printing and publication	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Communications			Type	0	0	0	0	0	0
GSM phones; on-call service	A	O							0
	A	C							0
Automatic call-back	A	O							0
	A	C							0
On-line computing			Type	30	30	30	0	0	90
									0
System management	A	O							0
	A	C							0
Data storage, (temporary on disk)	A	O							0
	A	C							0
Detector controls	A	O							0
	A	C							0
Computers/processors/LANs	A	O							0
	A	C							0
Software licenses	A	O							0
	A	C							0
Common desktop infrastructure	A	O							0
	A	C	30	30	30	0	0	0	90
Test beams, calibration facilities			Type	50	485	250	0	0	785
General operation	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Common electronics	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Electronics pool rentals	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Gas systems	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
Gas consumption	A	O	0	0	0	0	0	0	0
	A	C	0	0	0	0	0	0	0
External cryogenics	A	O	0	265	100	0	0	0	365
	A	C	50	220	150	0	0	0	420
Laboratory operations			Type	0	0	0	0	0	0
Assembly areas, clean rooms, active storage areas	A	O							0
	A	C							0
Workshops	A	O							0
	A	C							0

Hall 180. Data from D
Schinzel

Laboratory instruments	A	O							0
	A	C							0
General services	Type		120	390	740	550	0	0	1,800
Cooling & ventilation	A	O							0
	A	C							0
Power	A	O							0
	A	C							0
Power distribution system	A	O							0
	A	C							0
Heavy transport	A	O	0	90	440	250	0	0	780
	A	C	0	0	0	0	0	0	0
Cranes	A	O	120	300	300	300	0	0	1,020
	A	C							0
Cars	A	O							0
	A	C							0
Cleaning	A	O							0
	A	C							0
Survey	A	O							0
	A	C							0
Passive storage space	A	O							0
	A	C							0
Common desktop infrastructure	A	O							0
	A	C							0
Academic subsistence	A	O							0
	A	C							0
Outreach	A	O							0
	A	C							0
GRAND TOTALS			865	2,775	3,905	2,515	0	0	10,060

**M&O Cost Estimates in
kCHF**

ATLAS C&I ESTIMATES (kCHF) FOR MAGNETS

M=Maintenance/Repairs

O=Operations

EP-ATO/mm/300102

			2002	2003	2004	2005	2006	2007	TOT	Notes
Detector related costs	Type		265	1,270	1,840	510	0	0	3,885	
Magnet	A	O	60	60	60					180 H180. Numbers from D Schinzel
	A	C	25	25	25					75 H180. Numbers from D Schinzel
Magnet controls	A	O	150	150	150					450 H180. Numbers from D Schinzel
	A	C	30	45	50					125 H180. Numbers from D Schinzel
Magnet power supply	A	O								0
	A	C								0
Gas systems	A	O								0
	A	C								0
Gas consumption	A	O								0
	A	C								0
Cooling systems	A	O								0
	A	C								0
Cooling fluids(above -50°C)	A	O								0
	A	C								0
External cryogenics	A	O		640	1,060	400				2,100 Point 1. Numbers from D Schinzel.
	A	C		350	495	110				955 Point 1. Numbers from D Schinzel.
Proximity cryogenics	A	O								0
	A	C								0
Cryogenic fluids (below -50°C)	A	O								0
	A	C								0
Moving/hydraulic systems	A	O								0
	A	C								0
Detector safety systems	A	O								0
	A	C								0
Detector-specific radiation protection	A	O								0
	A	C								0
Shutdown activities	A	O								0
	A	C								0
Detector (re-)integration & survey	A	O								0
	A	C								0
General Technical support	A	O								0
	A	C								0
UPS maintenance	A	O								0
	A	C								0
Electronics pool rentals	A	O								0
	A	C								0
Beam pipe & vacuum	A	O								0
	A	C								0
Counting & control rooms	A	O								0
	A	C								0
Secretariat	Type		0	0	0	0	0	0	0	
Secretarial assistance	A	O								0
	A	C								0
Economat	A	O								0
	A	C								0
Fax, photocopiers, printers	A	O								0
	A	C								0
Printing and publication	A	O								0
	A	C								0
Communications	Type		0	0	0	0	0	0	0	
GSM phones	A	O								0
	A	C								0
GSM phones	B	O								0
	B	C								0
Automatic call-back	A	O								0
	A	C								0
Automatic call-back	B	O								0
	B	C								0
On-line computing	Type		0	0	0	0	0	0	0	
System management	A	O								0
	A	C								0
Data storage, (temporary on disk)	A	O								0
	A	C								0
Detector controls	A	O								0
	A	C								0
Computers/processors/LANs	A	O								0
	A	C								0
Software licenses	A	O								0
	A	C								0

Common desktop infrastructure	A	O	0
	A	C	0

<i>Test beams, calibration facilities</i>	<i>Type</i>		50	485	250	0	0	0	785
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General operation	A	O							0
	A	C							0
Common electronics	A	O							0
	A	C							0
Electronics and DAQ	B	O							0
	B	C							0
Counting & control rooms	A	O							0
	A	C							0
Gas systems	A	O							0
	A	C							0
Gas consumption	A	O							0
	A	C							0
Gas systems	B	O							0
	B	C							0
Gas consumption	B	O							0
	B	C							0
External cryogenics	A	O	0	265	100				365 Hall 180. Numbers from D Schinzel
	A	C	50	220	150				420 Hall 180. Numbers from D Schinzel
Proximity cryogenics	A	O							0
	A	C							0
Safety & radioprotection	A	O							0
	A	C							0
Irradiations	B	O							0
	B	C							0
Modifications	A	O							0
	A	C							0
Modifications	B	O							0
	B	C							0
Electronics pool rentals	A	O							0
	A	C							0
Electronics pool rentals	B	O							0
	B	C							0

<i>Laboratory operations</i>	<i>Type</i>		0	0	0	0	0	0	0
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Assembly areas, clean rooms, active storage areas	A	O							0
	A	C							0
Assembly areas, clean rooms, active storage areas	B	O							0
	B	C							0
Workshops	A	O							0
	A	C							0
Workshops	B	O							0
	B	C							0
Laboratory instruments	A	O							0
	A	C							0
Laboratory instruments	B	O							0
	B	C							0
Electronics pool rentals	A	O							0
	A	C							0
Electronics pool rentals	B	O							0
	B	C							0

<i>General services</i>	<i>Type</i>		0	0	0	0	0	0	0
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Cooling & ventilation	A	O							0
	A	C							0
Power	A	O							0
	A	C							0
Power distribution system	A	O							0
	A	C							0
Heavy transport	A	O							0
	A	C							0
Cranes	A	O							0
	A	C							0
Cars	A	O							0
	A	C							0
Cars	B	O							0
	B	C							0
Safety & radioprotection	C	O							0
	C	C							0
INB compliance	C	O							0
	C	C							0
Radioactive waste disposal	C	O							0
	C	C							0
Access system	C	O							0
	C	C							0

Elevators	C	O	0
	C	C	0
Gerant de site	C	O	0
	C	C	0
Flood control	C	O	0
	C	C	0
Insurance (CERN standard)	C	O	0
	C	C	0
Cleaning	A	O	0
	A	C	0
Cleaning	C	O	0
	C	C	0
Survey	A	O	0
	A	C	0
Survey	B	O	0
	B	C	0
Passive storage space	A	O	0
	A	C	0
Passive storage space	B	O	0
	B	C	0
Common desktop infrastructure	A	O	0
	A	C	0
Office space	C	O	0
	C	C	0

Consultancy	Type	0	0	0	0	0	0	0
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Reviewing	A	O	0
	A	C	0
Engineering	A	O	0
	A	C	0
Training	A	O	0
	A	C	0

Outreach	Type	0	0	0	0	0	0	0
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Outreach	A	O	0
	A	C	0

GRAND TOTALS	315	1,755	2,090	510	0	0	4,670
A TOTAL	315	1,755	2,090	510	0	0	4,670
B TOTAL	0	0	0	0	0	0	0
C TOTAL	0	0	0	0	0	0	0

**SUMMARY OF ATLAS
MAGNETS PER TYPE**

Magnets

		2002	2003	2004	2005	2006	2007	Total	
Mechanics	O	60	60	60	0	0	0	180	Incl. Gen services
	C	25	25	25	0	0	0	75	
Electronics	O	150	150	150	0	0	0	450	
	C	30	45	50	0	0	0	125	
Cryogenics	O	0	905	1,160	400	0	0	2,465	
	C	50	570	645	110	0	0	1,375	
TOTALS		315	1,755	2,090	510	0	0	4,670	

**M&O Cost Estimates in
kCHF**

ATLAS C&I ESTIMATES (kCHF) FOR TDAQ

M=Maintenance/Repairs

O=Operations

EP-ATO/mm/300102

2002 2003 2004 2005 2006 2007 TOTAL Notes

Detector related costs Type 0 0 100 510 0 0 610

Dummy	A	O					0	
	A	C					0	
Dummy	A	O					0	
	A	C					0	
Magnet power supply	A	O					0	
	A	C					0	
Gas systems	A	O					0	
	A	C					0	
Gas consumption	A	O					0	
	A	C					0	
Cooling systems	A	O					0	
	A	C					0	
Cooling fluids(above -50°C)	A	O					0	
	A	C					0	
External cryogenics	A	O					0	
	A	C					0	
Proximity cryogenics	A	O					0	
	A	C					0	
Cryogenic fluids (below -50°C)	A	O					0	
	A	C					0	
Moving/hydraulic systems	A	O					0	
	A	C					0	
Detector safety systems	A	O					0	
	A	C					0	
Detector-specific radiation protection	A	O					0	
	A	C					0	
Shutdown activities	A	O					0	
	A	C					0	
Detector (re-)integration & survey	A	O					0	
	A	C					0	
General Technical support	A	O					0	
	A	C					0	
UPS maintenance	A	O					0	
	A	C					0	
Electronics pool rentals	A	O					0	
	A	C					0	
Beam pipe & vacuum	A	O					0	
	A	C					0	
Counting & control rooms	A	O					0	
	A	C					0	

Secretariat Type 0 0 0 0 0 0 0

Secretarial assistance	A	O					0	
	A	C					0	
Economat	A	O					0	
	A	C					0	
Fax, photocopiers, printers	A	O					0	
	A	C					0	
Printing and publication	A	O					0	
	A	C					0	

Communications Type 0 0 0 0 0 0 0

GSM phones	A	O					0	
	A	C					0	
GSM phones	B	O					0	
	B	C					0	
Automatic call-back	A	O					0	
	A	C					0	
Automatic call-back	B	O					0	
	B	C					0	

On-line computing Type 0 0 0 0 0 0 0

System management	A	O					0	
	A	C					0	
Data storage, (temporary on disk)	A	O					0	
	A	C					0	
Detector controls	A	O					0	
	A	C					0	
Computers/processors/LANs	A	O					0	
	A	C					0	
Software licenses	A	O					0	
	A	C					0	

Common desktop infrastructure	A	O							0
	A	C							0
Test beams, calibration facilities	Type		0	0	0	0	0	0	0
General operation	A	O							0
	A	C							0
Common electronics	A	O							0
	A	C							0
Electronics and DAQ	B	O							0
	B	C							0
Counting & control rooms	A	O							0
	A	C							0
Gas systems	A	O							0
	A	C							0
Gas consumption	A	O							0
	A	C							0
Gas systems	B	O							0
	B	C							0
Gas consumption	B	O							0
	B	C							0
External cryogenics	A	O							0
	A	C							0
Proximity cryogenics	A	O							0
	A	C							0
Safety & radioprotection	A	O							0
	A	C							0
Irradiations	B	O							0
	B	C							0
Modifications	A	O							0
	A	C							0
Modifications	B	O							0
	B	C							0
Electronics pool rentals	A	O							0
	A	C							0
Electronics pool rentals	B	O							0
	B	C							0
Laboratory operations	Type		0	0	0	0	0	0	0
Assembly areas, clean rooms, active storage areas	A	O							0
	A	C							0
Assembly areas, clean rooms, active storage areas	B	O							0
	B	C							0
Workshops	A	O							0
	A	C							0
Workshops	B	O							0
	B	C							0
Laboratory instruments	A	O							0
	A	C							0
Laboratory instruments	B	O							0
	B	C							0
Electronics pool rentals	A	O							0
	A	C							0
Electronics pool rentals	B	O							0
	B	C							0
General services	Type		0	0	0	0	0	0	0
Cooling & ventilation	A	O							0
	A	C							0
Power	A	O							0
	A	C							0
Power distribution system	A	O							0
	A	C							0
Heavy transport	A	O							0
	A	C							0
Cranes	A	O							0
	A	C							0
Cars	A	O							0
	A	C							0
Cars	B	O							0
	B	C							0
Safety & radioprotection	C	O							0
	C	C							0
INB compliance	C	O							0
	C	C							0
Radioactive waste disposal	C	O							0
	C	C							0
Access system	C	O							0
	C	C							0

Elevators	C	O	0
	C	C	0
Gerant de site	C	O	0
	C	C	0
Flood control	C	O	0
	C	C	0
Insurance (CERN standard)	C	O	0
	C	C	0
Cleaning	A	O	0
	A	C	0
Cleaning	C	O	0
	C	C	0
Survey	A	O	0
	A	C	0
Survey	B	O	0
	B	C	0
Passive storage space	A	O	0
	A	C	0
Passive storage space	B	O	0
	B	C	0
Common desktop infrastructure	A	O	0
	A	C	0
Office space	C	O	0
	C	C	0

<i>Consultancy</i>	<i>Type</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
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Reviewing	A	O	0
	A	C	0
Engineering	A	O	0
	A	C	0
Training	A	O	0
	A	C	0

<i>Outreach</i>	<i>Type</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
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Outreach	A	O	0
	A	C	0

GRAND TOTALS			<i>0</i>	<i>0</i>	<i>100</i>	<i>510</i>	<i>0</i>	<i>0</i>	<i>610</i>
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A TOTAL	0	0	100	510	0	0	610
B TOTAL	0	0	0	0	0	0	0
C TOTAL	0	0	0	0	0	0	0

SUMMARY OF ATLAS

TDAQ PER TYPE

TDAQ		<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Total</i>
Mechanics	O	0	0	0	0	0	0	0
	C	0	0	100	510	0	0	610
Electronics	O	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0
Cryogenics	O	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0
TOTALS		0	0	100	510	0	0	610

C&I Cost Estimates in kCHF
ATLAS C&I ESTIMATES (kCHF) FOR TECH. COORD & GENERAL

M=Maintenance/Repairs

O=Operations

C=Consumables

EP-ATO/mn/070302

			2002	2003	2004	2005	2006	2007	TOTAL	Notes
Detector related costs	Type		400	600	945	945	0	0	2,890	
Magnet	A	O							0	
	A	C							0	
Magnet controls	A	O							0	
	A	C							0	
Magnet power supply	A	O							0	
	A	C							0	
Gas systems	A	O							0	
	A	C							0	
Gas consumption	A	O							0	
	A	C							0	
Cooling systems	A	O							0	
	A	C							0	
Cooling fluids(above -50°C)	A	O							0	
	A	C							0	
External cryogenics	A	O							0	
	A	C							0	
Proximity cryogenics	A	O							0	
	A	C							0	
Cryogenic fluids (below -50°C)	A	O							0	
	A	C							0	
Moving/hydraulic systems	A	O							0	
	A	C							0	
Detector safety systems	A	O							0	
	A	C							0	
Detector-specific radiation protection	A	O							0	
	A	C							0	
Shutdown activities	A	O							0	
	A	C							0	
Detector (re-)integration & survey	A	O	200	300	500	500			1,500	Designers and design engineering manpower for final configuration c
	A	C							0	
General Technical support	A	O	160	240	320	320			1,040	Technical support for integrate and commission traction system, cooli
	A	C	40	60	125	125			350	Materials & consumables
UPS maintenance	A	O							0	
	A	C							0	
Electronics pool rentals	A	O							0	
	A	C							0	
Beam pipe & vacuum	A	O							0	
	A	C							0	
Counting & control rooms	A	O							0	
	A	C							0	
Secretariat	Type		0	0	0	0	0	0	0	
Secretarial assistance	A	O							0	
	A	C							0	
Economat	A	O							0	
	A	C							0	
Fax, photocopiers, printers	A	O							0	
	A	C							0	
Printing and publication	A	O							0	
	A	C							0	
Communications	Type		0	0	0	0	0	0	0	
GSM phones	A	O							0	
	A	C							0	
GSM phones	B	O							0	
	B	C							0	
Automatic call-back	A	O							0	
	A	C							0	
Automatic call-back	B	O							0	
	B	C							0	
On-line computing	Type		30	30	30	0	0	0	90	
									0	
System management	A	O							0	
	A	C							0	
Data storage, (temporary on disk)	A	O							0	
	A	C							0	
Detector controls	A	O							0	
	A	C							0	
Computers/processors/LANs	A	O							0	
	A	C							0	
Software licenses	A	O							0	
	A	C							0	

Common desktop infrastructure	A	O						0
	A	C	30	30	30			90

<i>Test beams, calibration facilities</i>	<i>Type</i>		0	0	0	0	0	0
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General operation	A	O						0
	A	C						0
Common electronics	A	O						0
	A	C						0
Electronics and DAQ	B	O						0
	B	C						0
Counting & control rooms	A	O						0
	A	C						0
Gas systems	A	O						0
	A	C						0
Gas consumption	A	O						0
	A	C						0
Gas systems	B	O						0
	B	C						0
Gas consumption	B	O						0
	B	C						0
External cryogenics	A	O						0
	A	C						0
Proximity cryogenics	A	O						0
	A	C						0
Safety & radioprotection	A	O						0
	A	C						0
Irradiations	B	O						0
	B	C						0
Modifications	A	O						0
	A	C						0
Modifications	B	O						0
	B	C						0
Electronics pool rentals	A	O						0
	A	C						0
Electronics pool rentals	B	O						0
	B	C						0

<i>Laboratory operations</i>	<i>Type</i>		0	0	0	0	0	0
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Assembly areas, clean rooms, active storage areas	A	O						0
	A	C						0
Assembly areas, clean rooms, active storage areas	B	O						0
	B	C						0
Workshops	A	O						0
	A	C						0
Workshops	B	O						0
	B	C						0
Laboratory instruments	A	O						0
	A	C						0
Laboratory instruments	B	O						0
	B	C						0
Electronics pool rentals	A	O						0
	A	C						0
Electronics pool rentals	B	O						0
	B	C						0

<i>General services</i>	<i>Type</i>		120	390	740	550	0	0	1,800
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Cooling & ventilation	A	O							0
	A	C							0
Power	A	O							0
	A	C							0
Power distribution system	A	O							0
	A	C							0
Heavy transport	A	O		90	440	250			780 Each transport 30 kCHF. Just special transports above 20 tons each us
	A	C							0
Cranes	A	O	120	300	300	300			1,020 7 cranes in Pit 1, 6 operators @60kCHF/FTE '03-05 of which 5 for C
	A	C							0
Cars	A	O							0
	A	C							0
Cars	B	O							0
	B	C							0
Safety & radioprotection	C	O							0
	C	C							0
INB compliance	C	O							0
	C	C							0
Radioactive waste disposal	C	O							0
	C	C							0
Access system	C	O							0
	C	C							0

Elevators	C	O						0
	C	C						0
Gerant de site	C	O						0
	C	C						0
Flood control	C	O						0
	C	C						0
Insurance (CERN standard)	C	O						0
	C	C						0
Cleaning	A	O						0
	A	C						0
Cleaning	C	O						0
	C	C						0
Survey	A	O						0
	A	C						0
Survey	B	O						0
	B	C						0
Passive storage space	A	O						0
	A	C						0
Passive storage space	B	O						0
	B	C						0
Common desktop infrastructure	A	O						0
	A	C						0
Office space	C	O						0
	C	C						0
Consultancy	Type		0	0	0	0	0	0
Reviewing	A	O						0
	A	C						0
Engineering	A	O						0
	A	C						0
Training	A	O						0
	A	C						0
Outreach	Type		0	0	0	0	0	0
Outreach	A	O						0
	A	C						0
GRAND TOTALS			550	1,020	1,715	1,495	0	0
A TOTAL			550	1,020	1,715	1,495	0	0
B TOTAL			0	0	0	0	0	0
C TOTAL			0	0	0	0	0	0

**SUMMARY OF ATLAS
TECHNICAL COORD. PER
TYPE**

TCn & General

		<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Total</i>
Mechanics	O	480	930	1,560	1,370	0	0	4,340
	C	40	60	125	125	0	0	350
Electronics	O	0	0	0	0	0	0	0
	C	30	30	30	0	0	0	90
Cryogenics	O	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0
TOTALS		550	1,020	1,715	1,495	0	0	4,780

19-Mar-02

SUMMARY OF C&(B) kCHF

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7-Mar-02

C&I (B) kCHF

EXPERIMENT: ATLAS											
Subs	ID	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTALS
	Mechanics	20	25	23	10						78
	Gas-system	25	75	100							200
	Cryo-system										0
	Cooling system	40	180	280	180						680
	FE electronics (spares)										0
	Standard electronics, PS (LV, HV)										0
	Standard electronics, Crates										0
	Standard electronics, RO Modules										0
	Controls, (DCS, DSS)	30	25	20	15						90
	Sub-Detector Spares										0
	Areas										0
	SR-maintenance facility (buildup)	238	163	60	60						521
	SR-maintenance facility (operation)	234	331	336	205						1106
	Testbeam and irradiation										0
	Systemtests										0
	Communications	5	5	5	5						20
	Store Items	66	89	89	55						299
	Hired Manpower @ CERN (CHF)										0
	Standard tasks	115	220	270	200						805
	Special interventions										0
	Technical Manpower @CERN (FTE)	1	2	3	1						7
	TOTALS (excl. FTEs)	773	1113	1183	730	0	0	0	0	0	3799
	Spares paym.advcmnt profile	0	0	0	0	0	0	0	0	0	0

NMR probes for field monitoring

Gas for SR; B154

Fluids, for cooling in assembly setups, SR and during commissioning

Setup of SR-facility, primary cooling, racks and plumbing for racks, UPS systems, static floor, laser room with ventilation, safety systems, pad for CMM

Pool items, scopes, multimeters, small instruments, cleaning, cleanroom clothing, PCs, DCS and control for cooling and gas, licenses, platforms, tooling and handling equip, trolleys,

GSM phones

Store

Manpower for SR and installation, preparation and installation of services, piping and patchpanels, same for gas and cooling systems

18-Mar-02

C&I (B) kCHF

EXPERIMENT: ATLAS										
Subsystem: LAr	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTALS
Mechanics	10	10	10	10	0					40
Gas-system										0
Cryo-system		70	70	120						260
Cooling system		5	5	5						15
FE electronics (spares)										0
Standard electronics, PS (LV, HV)										0
Standard electronics, Crates	20	90	90	100						300
Standard electronics, RO Modules				30						30
Controls, (DCS, DSS)				10						10
Sub-Detector Spares										0
Areas										0
Communications	5	5	5	5						20
Store Items	40	120	120							280
Hired Manpower @ CERN (CHF)	385	335	495	365						1580
Technical Manpower @CERN (FTE)	26	35	13	0						74
TOTALS (excl. FTEs)	460	635	795	645	0	0	0	0	0	2535
Spares paym.advcmnt profile										
				0	0	0	0	0	0	0

Air pads (services)

Cryo system B180 (small parts), liquid argon for cold tests of three cryostats

Cooling power supplies, FE crates

Lab.equipment (DVM's, oscilloscopes,TDRs), tpeial test/measuring devices

Programs licences (Labview, DSP programs, compiler, ...), replacement of in crate comp.hardware

Replacement of components for local DCS (ELMBs,sensors,...)

GSM phones (1 kCHF/FTE/y)

Stores (sheet metal, elec.components,...)

Technicians & welders, C&C technicians included. In 2004, heavy transport in C&I (TCn). Tech. Manpower delegated from

Tech. Manpower delegated from LAr institutes for detector integration in B180 & EHN1

19-Mar-02

C&I (B) kCHF

EXPERIMENT: ATLAS															
Subsystem: Muons		2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTALS				
	Mechanics	0	0	80	40						120	Survey, tools for transporting			
	Gas-system	10	30	120	100						260				
	Cryo-system										0	Operation of assebled detectors. 3% of CORE value			
	Cooling system			60	90						150				
	FE electronics	20	50	120	100						290		Electronics for testing chamber modules		
	Standard electronics, PS (LV, HV)										0	Testing eqpm for chambers(scintillators, PMS, R-O)			
	Standard electronics, Crates	0	30	140	40						210				
	Standard electronics, RO Modules										0				
	Controls, (DCS, DSS)										0				
	Sub-Detector Spares										0				
	Areas			30							30	Transport structures for chanbers			
	Communications	5	5	5	5						20	GSM phones			
	Store Items										0				
	Hired Manpower @ CERN (CHF)	205	405	505	120						1235	Eng. studies, gas system op, integration work, transport			
	Technical Manpower @CERN (FTE)	3	6	19	13						41	Assembly of detectors at CERN			
TOTALS (excl. FTEs)		240	520	1060	495	0	0	0	0	0	2315				
Spares paym.advcmnt profile											0	0	0	0	0

14-Feb-02

C&I (B) kCHF

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n 2004-2005